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ABSTRACT

This curriculum guide for an interdisciplinary pottery unit includes concepts and objectives, student activities, and suggested resources. Introductory material indicates it was designed as a 2-day minicourse for the Mountain School seventh grade at Charles Counts' Pottery Workshop in Georgia but that material is adaptable to a regular school building if it is supplemented by field trips and out-of-doors activities and if teachers experienced in the craft are eager to learn with the students and willing to do some research and careful preparation. Contents include (1) list of math, science, social studies, art, and physical education concepts for the unit; (2) list of objectives: appreciation of one of man's oldest arts, craft experience, academic learning in a new and practical context, increased awareness of local geology, increased awareness of varied talents in the local community; (3) schedule for the 2-day pottery workshop minicourse using group rotation to provide a large number of students with a variety of experiences in a special setting in a short time; (4) background information on pottery; (5) student activities in local clay (finding, preparing, testing), in forming clay, in primitive firing, and in glaze-making; (6) pottery vocabulary glossary, and (7) suggested resources (books, magazines, films). (HD)

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Pottery

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by Rubynelle Counts

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INTRODUCTION

One of the primary reasons for the existence of The Mountain School, as stated in the original objectives, is "to utilize the rich mountain environment—natural, cultural, historical and human."

A pottery course is a logical vehicle for using this school's unique environment while practical instruction in the academic areas is being provided.

Lookout Mountain, home of The Mountain School, is especially endowed geologically—an advantage to the ceramics student interested in digging his own clay and experimenting with grinding his own glaze ingredients rather than taking for granted the chemicals supplied by dealers. The scenic beauty has attracted many settlers to the area, among them professional potters, some of whom are published writers as well as teachers of their craft.

A study of pottery naturally includes social studies, geology, physics, chemistry, mathematics, consumer science, art and design, movement that improves physical coordination and communication skill development. Therefore, pottery is a logical medium for an interdisciplinary curriculum.

Though The Mountain School has a special situation for a pottery course, any group of students anywhere with access to a kiln or just an open field for primitive firing activities can enjoy an educational experience with clay.

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CONCEPTS

Mathematics and Science

Pottery production requires a practical knowledge of geology, chemistry, physics, mathematics, market analysis and communication skills, as well as physical coordination and skills unique to the craft.

The ceramics industry supplies effects important to nearly every area of contemporary existence from dishes to missile parts.

Social Studies

Pottery artifacts have been a prime source of knowledge about ancient cultures.

The comparison of clay-forming and firing methods in different parts of the world increases cultural awareness, appreciation and understanding.

Art

Pottery as a handcraft provides a means of involvement in basic processes, use of earth materials and expression of individuality as few other modern activities can claim.

Physical Education

Manipulation of clay provides therapeutic value emotionally and physically.

OBJECTIVES

- To provide a basis for appreciating one of man's oldest arts.
- To provide students with a craft experience.
- To furnish academic learning experiences in a new, practical context.
- To increase awareness of local geology.
- To increase awareness of the varied talents found within the local community.

ACTIVITIES

The student will

- observe wheel-throwing, kiln-firing and commercial ceramic production on field trips or by audio-visual means.
- hike to observe local geology.
- dig local clay.
- test local clay for plasticity and shrinkage.
- make a pinch pot.

- make a texture tile.
- make a coil pot.
- form beads from different colored clays.
- if possible, experiment with throwing on the potter's wheel.
- if feasible, have a piece of his clay-work fired in a kiln.
- if feasible, participate in a primitive firing.
- calculate the weights of chemicals required to mix a batch of a given glaze.
- use a gram scale to weigh out a glaze according to a given glaze formula.
- do relevant reading.
- study and be tested on pottery-related vocabulary.
- participate in discussions of historical, sociological and philosophical aspects of the pottery craft.
- write poetry and/or an essay related to pottery.

PROCEDURE

The following page shows a two-day schedule typical of the mini-course offered each year for The Mountain School seventh grade at Charles Counts' Pottery Workshop. The course is directed by Mrs. Counts, one of the school's teachers and herself an experienced potter, and instruction is contributed by the workshop staff.

Similar activities of equal excitement and educational value can be experienced in a regular school building supplemented by field trips and out-of-doors activities if teachers inexperienced in the craft are eager to learn with the students and willing to do some research and careful preparation.

The given schedule uses group-rotation to provide a large number of students with a variety of experiences in a special setting in a short time. Such an intense program needs advance orientation, and regular teachers need to be familiar with its content in order to tie in its relevance to the regular curriculum. A smaller group could foreseeably benefit from less arbitrary transitions between activities; and a complete unit containing its own introduction, evolution and wrap-up would have some advantages.

SCHEDULE FOR THE POTTERY WORKSHOP MINI-COURSE

Wednesday's Schedule

Period	Group A	Group B	Group C	Group D
I. 9:30-10:15	Shop Tour *(Mrs. Hawes)* begin in showroom Enter front door.	Clay-Testing *(Mr. Westmeier)* woods classroom	Clay-Forming *(Mrs. Counts)* summer studio Enter through shop.	Glaze-Mixing *(Miss Brown)* rear studio Use back door.
II. 10:15-11:00	Glaze-Mixing	Shop Tour	Clay-Testing	Clay-Forming
III. 11:00-11:45	Clay-Forming	Glaze-Mixing	Shop Tour	Clay-Testing
Lunch	Lunch	Lunch	Lunch	Lunch
	(Picnic on the bluff. Lemonade is on the porch. Watch littering.)			
IV. 12:15-1:00	Clay-Testing	Clay-Forming	Glaze-Mixing	Shop Tour
V. 1:00-2:15	Everybody Goes Hiking! Stay With Group. Mr. Westmeier Leads.			

Thursday's Schedule

Period	Group A	Group B	Group C	Group D
I. 9:15-10:00	Slide Show *(Mrs. Hawes)* woods classroom	Tile-Making *(Miss Brown)* rear studio	Poetry of Pottery *(Mrs. Counts)* Counts' house	Wheel Work *(Mr. Westmeier)* summer studio
II. 10:00-10:45	Wheel Work	Slide Show	Tile-Making	Poetry of Pottery
III. 10:45-11:30	Poetry of Pottery	Wheel Work	Slide Show	Tile-Making
IV. 12:00-12:45	Tile-Making	Poetry of Pottery	Wheel Work	Slide Show
V. 12:45-1:15	Hiking by groups. Miss Brown's group leads.			
VI. 1:15-Bus time	General wrap-up and rap session on the bluff.			

BACKGROUND INFORMATION ON POTTERY

About three-fourths of the earth's surface is clay. There are all sorts of clay—each with its own usefulness—and many colors.

Clay is the result of a long geological process through which granite-type rock is broken down into fine particles. When clay remains where it originated, it is known as a "primary" or "residual" clay. When primary clays are pushed by glaciers, washed down streams, etc., they gather impurities that affect color and firing properties. These "secondary" or "sedimentary" clays are the ones most used by potters. Kaolin is the purest clay (technically: hydrous alumina silicate, formula: $AL_2O_3 \cdot 2SiO_2 \cdot 2H_2O$.) It is white and very fine-grained. It is thus so plastic that hand-forming of it is not practical, as it will not hold thinly-pulled shapes.

The secondary clays used by potters for making their ware include earthenware and stoneware. The third category of natural clay, porcelain (principally kaolin), is used in commercial ceramics production, especially those that produce fine china by casting or extrusion processes. Earthenware clays contain high percentages of fluxes (often iron, hence the familiar terra cotta color) which prevent the ware's becoming completely vitreous in firing. Pots made from earthenware will remain porous unless coated by a tight glaze. Stoneware clays become almost completely vitreous when fired at temperatures usually higher than those earthenware clays can take.

Most potters use a mixture of natural clays and sometime add commercially refined ingredients such as silica or ball clay or ilmenite to give openness, increase plasticity or add color and texture. The resulting material is known as a clay body. Every potter will deliberately choose his body, often after extensive experimentation, to suit his own particular requirements. Rarely will this body be a clay just as it is found in nature, although early potteries were set up at good clay deposits in order to take advantage of the natural material.

A good clay body must have two basic characteristics. It must have appropriate fireability; that is, it must be able to stand the heat of the kiln without cracking, sagging, warping or shrinking excessively. Also, a clay body must have workability; that is, it must allow itself to be manipulated and shaped, then hold itself in the given shape.

Most pottery produced today is glazed; that is, it is coated with glass to improve appearance and function. The main ingredient in glaze is silica, the glass-forming oxide. This material may be seen in abundance at beaches and often in "sand pits" throughout the area. It is available commercially refined into specific meshes (particle sizes) as are most ceramic raw materials.

Glazes must be made to fit the clay body and the firing conditions. The recipe for a glaze is determined by these factors as well as the effect desired. All glazes must contain silica, the glass former; a flux to cause the silica to melt; and a binder to cause the glaze to stick to the pot and harden appropriately. Earth oxides are chosen to yield the right amounts of these materials for the given ware and to give the color, texture and opacity desired. Most glaze materials are composed of combinations of several essential ingredients, and the potter calculates his formula for glazes so that the right amounts of ingredients are present in the batch, similar to the way an expert cook goes about creating a new recipe. It is interesting to make glazes out of local earth material, though experimentation necessary to do so usually is a project that requires great patience and much time. One potter in Georgia, now dead, made his favorite glaze from "wood ash and creek settlins," which supplied the necessary glass former, flux and binder.

White lead has traditionally been the most commonly used glaze flux. It is true that a low-fired pot with a lead glaze might cause lead poisoning if certain acids in foods held by the pot react with the lead. High temperature firing will cause lead to volitize so that the finished ware has no free lead

with which acids can react. Most potters today calculate their glazes to use fluxes other than lead.

Students should become aware of the raw materials mined in their area and find out how many of them are used in ceramic production.

STUDENT ACTIVITIES

Local Clay

Finding Clay

Clay is usually found where there is coal, and it is often found in caves, along stream banks or by freshly cut roads. Often it can be seen as white or bluish veins in the earth, but it can be any natural earth color. Clay is fine-grained, slick to feel and will hold its form when moistened and pressed into a ball.

Find something that seems to be clay? Take a handful and wet it by gradually adding water (Pros would use spit!). As you work it, does it seem smooth to touch and kind of oily feeling? Keep adding water slowly until you can form a compact ball. If it will not stick together, discard it and hunt a new sample. If you have a good ball, roll it between the hands into a coil. Bend the coil into a horseshoe shape. If the sample readily makes this form without breaking and without much cracking, you may have found some good clay. Gather a milk carton or coffee can full to take for further sampling.

Clay Preparation

Crumble the lumps in your clay sample and spread it out to dry. After the clay is dry, force it through a sieve or window screen to make clay flour.

Testing for Absorption and Shrinkage

Take one cupful of clay flour and weigh it before putting it into a mixing bowl. Measure one cup of water and weigh it. Be sure to account for the containers as you weigh the materials. Begin with adding one teaspoon of water to your clay in the bowl, and continue adding water by drops as you work the clay, using only as much liquid as is required to effect a workable mass. When this point is reached, determine exactly how much water you have used by weighing and measuring the leftover water and subtracting that amount from the amount you started with. Add the weight of water used to the weight of clay used to determine the weight of the wet clay you used. (Potters often weigh out equal balls of clay from which to make sets of pots such as mugs.)

Form the clay you have mixed into a bar as uniform as possible. Measure the bar accurately; then set it to dry where it will not be disturbed. After it is thoroughly dry (It won't feel cool and damp.) measure it again and weigh it. Subtract these figures from the wet clay figures to determine shrinkage. Change your difference into percentage.

If a kiln is available, fire your bars to remove chemical water and change the clay greenware into pottery (ceramics). Weigh and measure the fired bar as you did in earlier stages. Most good clay bodies have a total shrinkage of 10 to 15 percent. Greater shrinkage probably means that the clay would also warp when fired as pots; therefore, if your clay shrinks totally more than 15 percent, you will probably want to discard it as a body.

Exercise

Knowing the shrinkage of your clay body, determine the dimensions of a slab you would make from it to cut into mosaic tiles to be set in an iron table top 18 inches by 36 inches.

Forming Clay

Pinch Pots

Probably the first clay forming was done in this way. Some early person might have noticed that certain earth was slick and smooth to his feet as he walked along a creek bank. He must have scooped up a handful of this substance and begun to fiddle with it. A logical result of the rather aimless activity would be a wad or compressed ball. Then, wouldn't one automatically want to stick a finger or thumb into a ball of clay? If this impulse is followed, an indention is made which could hold something–a pot is created.

To make a pinch pot, start with a lump of clay that can be held easily in one hand. Throw it from hand to hand, squeezing it and slowly rounding it into a neat ball. Cup the ball in one hand for support while you firmly insert the thumb of the other hand. Then, using this thumb to press upward and outward from the inside of the clay lump while supporting the outside with the fingers as you rotate the clay on the palm of the other hand, gently form a thinly-walled bowl with even thickness throughout. The rim can be smoothed with finger pressure, assisted if necessary by a small amount of water. Try to avoid using water in the pinch-forming as it will tend to make the clay so weak that the bowl may slump out of shape. Carefully rap the bottom of the bowl on a tabletop to make a flattened base. Allow the pot to dry to a state which will allow handling; then scratch your initials on its base. Set it up to finish drying.

Texture Tiles

Clay is a wonderfully plastic material. That means that it can be formed by many different processes and into many different shapes. Students should experiment by texturing slabs of clay by as many different methods as they can devise. For a while, limit these methods to those effected by the unaided hands, such as pinching, twisting, indenting with thumbnails, etc. Then limit the patterning to one tool, say a pencil. The experiment can be most rewarding if all the participants have approximately the same size slab of clay rolled out with a rolling pin (or soft drink bottle or pipe) or patted out with the heel of the hand on a dry, clean board or open-weave cloth such as thin percale or burlap, and each student divides his slab by scratching with a fingernail into a given (say 10) number of sections for the texturing. The tiles can be exhibited together as a mosaic, and fired they can be used as interesting patio tiles or set into garden walls. They also might be used as decorative wall hangings.

Coiling

Historically, most pots have probably been formed by the coiling method. This is the method most Amerindian potters have used. The famous Pueblo blackware potter Maria Martinez said she started her pots with a clay tortilla onto which she added sausages in a circular manner. Follow her technique by first flattening a small ball of clay between the palms. Do not allow the edges of your clay pancake to become ragged. Place it onto a dry board and turn up its outer edge by pressing the clay between the thumb and middle finger while the forefinger presses downward from the top to control the rim, as you gently rotate the slab on the board surface with the other hand. Now, move the base aside to make room for rolling coils.

Pinch off a small amount of clay (about the size of the end of your thumb) and roll it between your

hands. When the clay starts to grow in length as if some magical force within it causes it to move itself, place it onto the board and roll the coil longer and finer by pushing it gently with the spreading fingertips, then following through with the palm and heal of the hands as it rolls. If a thumping sound is heard, the clay is not rolling properly; perhaps you are forcing it too much—try practicing the proper technique by rolling a pencil.

Theoretically, you should be working so fast that your clay will not need moistening. However, you will probably need to dip your finger into water and gently use it to dampen the top edge of your base and the side of your coil as it lies on the board. Then pick up an end of the coil (the entire coil should follow of its own accord) between the thumb and forefinger. This motion is somewhat like picking up a snake. Cradling the "tail" of the coil loosely in the hand, gently but firmly press the tip of the coil onto the base with downward and forward pressure of the thumb and forefinger while the fingers of the other hand on the outside and the thumb on the inside of the base maintain its original form. Slowly rotate the base to receive the rest of the coil as it is applied with like pressure. Overlap this coil's end with the beginning of a new coil to continue your pot according to your desired shape.

Most coil potters have used shells or potshards as scrapers to smooth the coil ridges into even pot walls. Try to imitate their technique, realizing that the delicate damp clay is still very plastic and will respond to pressure improperly applied by slumping. You must use one hand as a supporting cradle as you scrape with the other in order to keep your desired shape.

Effective coil pots which reveal their construction can be made by smoothing out only the inside ridges, leaving the coil texture on the outside as natural decorative patterns. Or, the walls can be made smooth to serve as background surfaces for other applied or incised texture. Study pots made by American Indians, indigenous South Americans and West Africans as inspiration for your own pot-making using the coil method of construction.

Hump Forming

Slabs of clay can be draped and gently paddled over smoothly rounded rocks to produce interesting trays and shallow bowls. The resulting pieces can also be joined together with moist coils while they are still pliable, and vases and bottles may be constructed.

Clay Beads

Assorted clays can be made into attractive beads easily by forming balls and coils, some of them textured variously, with holes for stringing made by pushing a nail through them.

Wheel-Throwing

Throwing pots on the potter's wheel is a skill to be respected. Students should at some time be allowed to experience the unique nature of the wheel, preferably under the guidance of a potter; but they should never be given license to abuse the equipment or materials. As an orientation to wheel-throwing, an instructor should take one student at a time with a half-pound clay ball that has been properly wedged. The instructor should give specific directions in a calm, reassuring manner to guide the student through centering the clay, opening the ball, forming the base and pulling up the side walls to "throw" a pot. The pot should then be cut off the wheelhead and set aside to dry—or returned to the clay box for reuse.

If possible, students with serious interest in throwing should be provided additional wheel time with more freedom to explore the phenomenon.

All clay-forming should be a delightful experience. Two conditions should be carefully avoided which can prevent a healthy atmosphere for claywork. Neither persnickety cleanliness nor childish horseplay can result in good clay craftsmanship. It must also be remembered that sometimes successful results seem to come rather easily, but master potters develop only by much practice. Therefore, students should be encouraged to consider the experiencing of clay processes rather than the production of finished pots as educationally worthwhile.

Primitive Firing

Most pottery produced today is fired in kilns carefully engineered to be heated by electricity or gas. Early American potters used wood-fired kilns, as many clay craftsmen in various parts of the world still prefer to do. A number of contemporary American potters, concerned with the energy crises, are now experimenting with wood as kiln fuel.

There are many kinds of kilns. Some have steel boxlike cases; some are dry-stacked firebricks; some are called "groundhog kilns" for good reason, because the stacker has to crawl through a tunnel to load the large firing chamber. Modern American potters who build their own kilns usually design boxes or arched forms; in Britain, kilns are usually igloo or beehive shapes; in Japan, they climb hills. Kilnbuilding is a good theme for a study of cultural differences and similarities.

Some of the Southwestern Indians have used adobe ovens or holes dug in the ground to fire their ware. Students may wish to research their firing techniques and simulate them.

Dramatic firing is done in Nigeria following an ancient tradition of producing storage jars, water bottles and cooking ware beautiful in their functioning for daily use by people not yet addicted to purified water flowing on demand from taps and push-button-controlled cooking ranges. Pottery fired by this West African method (called here "primitive firing" for lack of a more accurately descriptive term) is soft and porous so that it can allow liquid contents to cool by evaporation or take shock of a cooking fire as our high-fired, glazed artware cannot do without special materials added to the body. Students can make useful flowerpots, attractive beads and decorative wall plaques fired in this primitive way.

A simulated Nigerian firing begins with a bed of sticks laid directly on the ground. Pots are then placed carefully onto this base and may be stacked in a mound, as long as weight and structure of the pots are taken into consideration. The pots are covered with more sticks and lots of grass or hay substitute. (Grass is plentiful in the sub-Saharan savannah land of Northern Nigeria—check your geography.) The grass is then ignited, and more grass should be added during the burning. This should be continued for about 30 minutes as the intense heat around the ware changes the clay to pottery. The ash and pots are allowed to cool a few hours or as long as student's schedules will permit; then the pots may be raked away from the ashes with poles to become cool enough for handling.

In order to be successful, this kind of primitive firing must take place in dry weather when the ground, the grass and the pots to be fired are thoroughly dry. Dampness in any aspect can cause the disappointment of broken pots.

Glaze-Making

Glaze-making activities can be assigned to individual students or to teams according to interest, ability and background knowledge. A complete glaze chemistry course is attached to this general pottery program which can be used by students of advanced mathematical skill and scientific curiosity. Students at lower levels might only weigh out glaze materials following a given recipe. All students should have a chance to use the gram scales even if no kiln is available for test-firing glaze

samples. If firing is not feasible, handy kitchen supplies can be used to simulate glaze ingredients in order to provide insight into the glaze-making process and familiarity with names of common ceramic chemicals. In this case, students should be given a glaze percentage formula such as the following basic white matt recipe used in the Counts' Pottery Workshop and instructed to determine the gram weights of each ingredient needed to make a total dry batch of 500 grams. Other questions and suggested related activities are included.

Counts' Basic White Matt–Cone 6

Feldspar (nepheline syenite)	51.6
Silica (flint)	5.6
Whiting (calcium carbonate)	18.8
Zinc	8.6
Kaolin (china clay)	15.4
	100.0

How would you determine a 500 gram batch of this glaze?

Suppose that you have weighed out and thoroughly mixed dry a 500 gram batch of this glaze and wish to take from it 50 gram samples for color tests. The suggested percentages of commonly used colorants follow. Determine the weight of each you should use, one-half percent cobalt oxide, green; two percent iron oxide, rust or gray-brown; five percent manganese dioxide, black; three percent nickle oxide, gray.

If this exercise in glaze-making is to be executed practically, each student or each team will weigh a sample batch using the gram scales after the essential arithmetic has been done. As they are weighed, the ingredients should be placed in a gallon jar with a large mouth and a well-fitting lid. The combined materials must be thoroughly mixed by shaking the closed jar; then the dust should settle before the jar is opened so that 50 gram batches can be weighed for color tests.

Test tiles will be needed for firing the color samples. These may be commercial white tiles from a building supplies firm or they can be made from a clay body and bisque-fired. They must be carefully labeled as they are used. A thin solution of cobalt oxide is an effective labeling material. The name of the glaze (C^C Matt) and the colorant (CoO) should be written on the back of each tile.

Glaze samples can be mixed in small jars or paper cups. Add water slowly as you mix the glaze to a creamlike consistency. It generally takes about half as much water as dry material. Popsicle sticks make good stirrers. A small brush may be used to apply a dab of glaze sample to the tile. Make sure that no glaze is on the side or bottom of the tile as it would stick to the kiln shelf during firing. Don't forget to fire a tile with the base matt on it along with your color tests.

Some students should research the ingredients used in this glaze to find why these materials were chosen and why the given proportions.

POTTERY VOCABULARY

bisque – ware that has been fired a little so that glazing can be more easily done

clay – fine-grained, plastic earth used in making pottery

clay body – a particular mixture of clay

combustion – fire

earth oxides – chemicals used in making glazes or clay bodies usually for color

earthenware – pottery that water seeps through – such as flowerpots

fire – to process a kiln with heating fuel such as electricity, gas, oil, wood

glaze – thin coating of glass used to finish pottery

high-fire – fired at high temperature

kiln – piece of equipment in which pottery is fired

kiln shelf – shelf made of special material used to stack ware on a kiln

kiln wash – solution painted on kiln shelves to prevent pots from sticking to the shelves

low-fire – fired at a relatively low temperature

oxidation atmosphere – condition inside kiln when there is an equal amount of fuel and oxygen for combustion

plaster casting – forming of pottery in molds made of plaster of paris

plastic – pliable, capable of being shaped or formed

porcelain – finest pottery, china, often translucent

pottery – clay ware or the place where such is made

pottery wheel – price of equipment on which pottery is produced by throwing

pyrometer – device for measuring heat

pyrometric cones – clay tapers used as pyrometers

reduction atmosphere – combustion condition when there is insufficient oxygen so that oxygen is taken from wares, resulting in color changes (copper in oxidation = green; in reduction = red)

scales – device for weighing out glaze materials

slip – specially prepared liquid clay

stoneware – vitreous pottery

throwing – another name is turning – the process of forming pottery on a wheel

vitreous – glass like, incapable of seeping water

kaolin
silica (flint) – (SiO_2)
feldspar
whiting – ($CaCO_3$)
cobalt oxide – (CoO_2)
iron oxide – (Fe_2O_3)
manganese dioxide – (MnO_2)
chromium – (CrO_2)
rutile
colemanite
lead – (PbO)
copper – (CuO)

} chemicals used in pottery production

SUGGESTED RESOURCES

Books

Many books on pottery are easily available, and most of them have worthwhile chapters on the history of ceramics, clay composition, glaze experimentation and standard firing techniques, as well as suggestions for clay construction. If one guidebook is to be purchased, it should be *Pottery Workshop* by Charles Counts (Macmillan: 1973; $8.95).

The Spider, The Cave and The Pottery Bowl by Eleanor Clymer is a simple, beautiful story that may be effectively read aloud to any age group as an introduction to the pottery mini-course to foster appreciation of archeology and artifacts and understanding of the rich cultural heritage of American Pueblo Indians. (Atheneum: 1972, and *Weekly Reader* Children's Book Club)

Magazines

Ceramics Monthly magazine, any issue, will be of interest.

Encyclopedias

Encyclopedias contain important and interesting material to provide background understanding and additional information. Student reports may be based on readings under headings such as "Pottery," "Porcelain," "Stoneware," "Earthenware," "Ceramics," "Kilns," "Folk Arts," "Handicrafts," "Guilds" as well as subheadings such as "Industry" and "Culture" under the names of states, countries and cultures.

Special Publications

A geological survey of your county should be available from your state department of natural resources.

Films

"The Village Potters of Onda" is an excellent 27-minute film produced by a sensitive American potter to present the activities and ways of life of a remote Japanese pottery village where techniques have remained relatively unchanged for more than 250 years. This film should be included if at all possible and may be rented ($4) from the University of Georgia Film Library, Center for Continuing

Education, Athens, Georgia 30601 or from Your Portable Museum, American Craftsmen's Council, 29 W. 53rd Street, New York, New York 10019 at higher rates. Check other services.

"Clay" is a whimsical short film that will delight any audience as it illustrates the unique plastic quality of clay. Check with your local library and state school film service or rent from the American Craftsmen's Council.

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